Enrolment No._____

SARVAJANIK UNIVERSITY

S-2025 Date: 13-08-25 Time: 09:30 AM to 12:30 PM
Interim Backlog Exam

B. Architecture - SEMESTER– II EXAMINATION

Course Code: BRAR12203 **Total Marks: 180**
Course Name: BUILDING MATERIALS, SYSTEMS AND ENVIRONMENTAL SCIENCE
Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

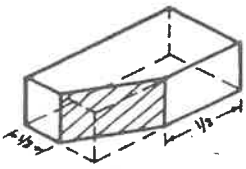
Q.1. (A) Do as Directed **(20)**

1. Wooden lintel Bearing should be of _____mm so as to create level and firm bearing.
2. Width of wooden lintel should be equal to _____
3. Depth of wooden lintel is generally 1/12 to 1/8 of _____
4. Macro-climate is climate of larger area such as a country. (True / False)
5. Climate is the long-term average of weather. (True or False)
6. Weather protection is generally provided at _____ level.
7. Stone masonry having finely dressed stones laid in cement or lime mortar is known as _____
8. In _____brick laid with its length parallel to the face or front or direction of the wall.
9. Raw bricks shrink and warp during drying and burning in case of excess presence of alumina. (True/false)
10. A first-class brick should not absorb water more than 20 - 22% by weight. (True/false)

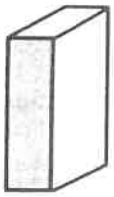
(B) Select the correct answer **(20)**

1. The vertical part of the step of staircase is known as
   a) Riser b) tread c) staircase d) soffit
2. Sloped wooden members supporting the roof structure are known as
   a)Rafters b) Joists c) Headers d) purlin
3. Following is a sound & hard timber.
   a) Pine b) Bamboo c) Teak d) mango tree
4. The tropical climate which consists of heat waves ,hot winds and low humidity falls under which climatic conditions?
   a) Hot-wet b) Hot-dry c) Cool-dry d) Rainy

5. What is termed as Height above Sea Level?
   a) Altitude b) Latitude c) Option A & B d) None of these
6. In the given list below which are the factors affecting Climate?
   a) Latitude b) Ocean Currents c) Prevailing Wind d) All of these
7. Identify the given image.



   a.) Mitred Closer b.) King Closer c.) Bevelled Closer d.) Bevelled bat small
8. The standard brick size is
   a.) 19cm x 9cm x 9 cm b.) 20 cm x 10cm x 5cm
   c.) 23 cm x 11.5cm x 7.5 cm d.) 23 cm x 7.5 cm x 11.5 cm
9. The portion of brick cut across the width in the half is called
   a) Half Split b.) Half Closer c.) Half Bat d.) Half Bed
10. Identify the given brick position



a.) Stretcher b.) Header c.) Soldier d.) Rowlock

Q2. Answer in Brief (Any four) (20)

1. Explain function of the window. Enlist various types of window.
2. Define & explain difference between weather & climate
3. Explain the difference amongst 1st class ,2nd class and 3rd class brick.
4. Explain defects in brick masonry.
5. Explain with sketches stringer beam, tread, risers and nosing in a stair.
6. What are the chemical components present in the soil for good brick earth?

Q3: Sketch and Label the following in detail (Any Four) (20)

1. Wooden stud wall framing
2. Double shutter wooden door frame.
3. Sketch an arch & label all the components
4. House form for hot & dry regions.
5. Random Rubble Coursed Stone Masonry
6. Plan and elevation of one brick thick Flemish bond

Q.4. Answer in detail with neat sketches. (Any Two) (20)

1. Explain component of the wooden staircase
2. Explain the characteristics of cold climate
3. What are the constituents of a good brick? Explain the entire brick manufacturing process in detail with neat sketches.

Q.5 (20)

Calculate & draw bending stress diagram for a beam as shown **in fig-1**. Cross section of a beam is shown in **Fig-2** .

Q-6 Attempt any three questions out of following ~~(60)~~ (60)

(i) Calculate & draw shear stress diagram for a cantilever beam subjected to full uniformly distributed load of 60 KN/m on a span of 2 m. cross section of a beam is shown in **Fig-3.**

(ii) Calculate maximum deflection for a beam shown in **Fig - 4.**

(iii) Calculate load carrying capacity of a column using Rankine's formula having one end fixed & another free. Cross section of column is hollow rectangular with outer dimension 100 mm X 50 mm with thickness of 10 mm.Take Est = 2×10^5 N/ mm^2, fc = 330 N/ mm^2, α = 1/ 7500. Actual length of column is 2 m.

(iv) Calculate net stress at points A,B,C & D for a column subjected to eccentric load P of 1000 KN as shown in **Fig-5.**

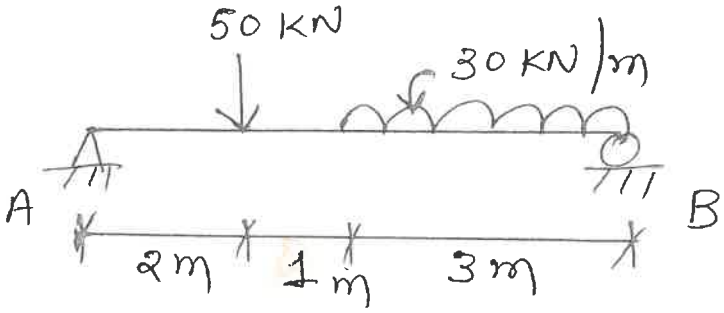


FIG-1

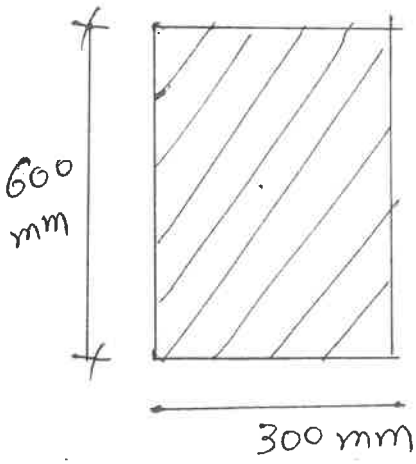


FIG-2

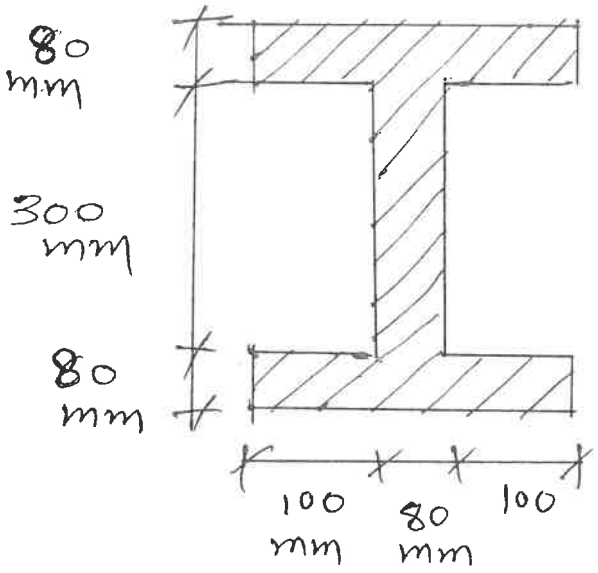


FIG-3

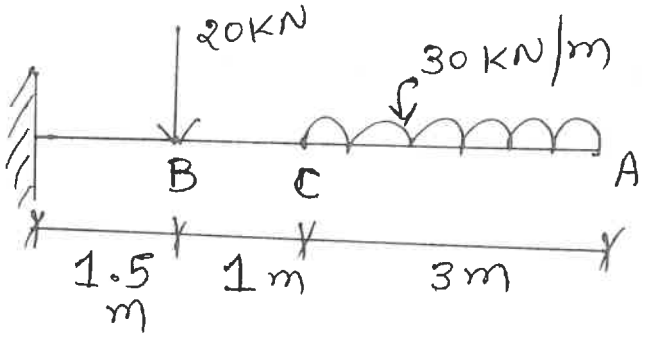


FIG-4

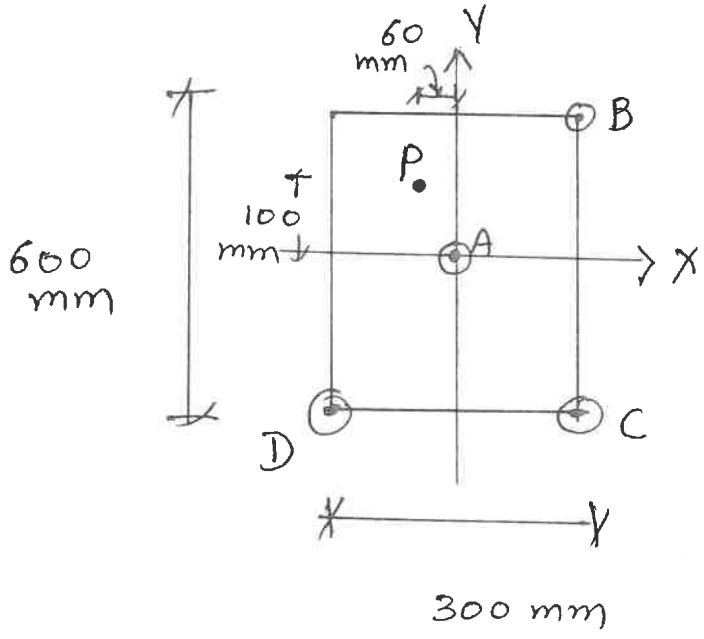


FIG-5